

REMARKS

Claims 21-41 are pending in the current application. Applicants have amended claims 21 and 35. Reexamination and reconsideration of all of the claims are respectfully requested.

The Office Action rejected claims 21-22, 25, 28-29, 32, 35-36, and 39 under 35 U.S.C. §102 as being anticipated by Kreuzer et al., U.S. Patent 4,335,313 (“Kreuzer”). The Office Action objected to the remaining claims but indicated allowable subject matter was present. Applicants acknowledge and appreciate this finding.

Kreuzer discloses a method and apparatus for precisely aligning the pattern of an opaque lithographic mask with a previously exposed pattern on a substrate wafer by providing a plurality of alignment targets on one surface of each of the mask and the wafer. The Kreuzer opaque mask and integrated circuit wafer alignment method and apparatus is said to retain the alignment between the mask and wafer for subsequent exposure of said wafer through said mask. (Abstract) Kreuzer discusses aligning the pattern of an opaque mask with a previously exposed pattern on a silicon wafer. (*Id.*) Three separate optical channels are said to be aligned in Kreuzer so that their axes coincide with three targets on the wafer. (*Id.*) The objectives are also adjusted to the same vertical distance from the wafer. (*Id.*) Thereafter, the optical channels remain fixed. (*Id.*) The wafer is retracted a short distance and is replaced by the mask which also has three targets. (*Id.*) The mask is then shifted to align the targets with the prealigned optical axes. (*Id.*) When mask alignment is completed, the mask and the wafer are removed as a unit to an exposure station. (*Id.*)

In essence, Kreuzer discloses a design for aligning optical masks with a pattern on a substrate wafer. Missing from the Kreuzer reference are, *inter alia*: (1) inspecting a semiconductor wafer; (2) inspecting both sides of a semiconductor wafer; (3) damping the semiconductor wafer by mounting, for example, a substantially rigid element proximate the semiconductor wafer; and (4) employing a detector for receiving light energy reflected from the semiconductor wafer for said inspecting. Simply put, while the

Kreuzer design discloses an optical system, optical head, microscope, and an optical selector, the activity and procedures employed by the optical system are for alignment of photomasks with an established pattern on the Kreuzer wafer and not inspection. Further, any damping present in Kreuzer materially differs from that claimed in Applicants' claims.

Claim 21

Claim 21 has always included the phrase “a system for *inspecting* a semiconductor wafer.” Kreuzer simply does not inspect or perform inspections of semiconductor wafers. As amended, claim 21 further requires: means for directing light energy toward the semiconductor wafer *for said inspecting*; and means for receiving the reflected light energy from the semiconductor wafer, wherein said receiving means are employed *for said inspecting*. (Emphasis added).

None of these limitations is present in Kreuzer. Kreuzer provides a method and apparatus for aligning an opaque mask pattern with a wafer pattern for the purposes of retaining the alignment within a cartridge ready for transport to an exposure station while retaining said alignment, whereas the present design provides a system and method for inspecting a semiconductor wafer.

The Office Action attempts to relate the “means for directing light” claim limitation of claim 21 with Kreuzer using the following passage at Col. 4, lines 55-63:

Radiation from the selected channel is directed through relay telescope 80 to a microscope eyepiece 82 and a photoelectric detector 84 for display on an oscilloscope 86.

As will be seen in FIG. 8, the optical system 58 includes an optical head 88 and a microscope 90 with the optical channel selector 68 therebetween. The optical head houses the three illuminators 64 and the elements of the three alignment channels 66.

The full limitation in amended claim 21 is “means for directing light energy toward the semiconductor wafer for said inspecting.” As no inspecting is performed, and no inspecting disclosed or suggested by this passage, the directing means is not shown in Kreuzer.

For the “damping means” element, the Office Action relies on the following passage at Col. 12, lines 53-59:

In the following description of the operation of the method and apparatus of this invention, it is assumed that a wafer is employed which has previously been lithographed with at least one pattern, thus requiring alignment of a subsequent mask pattern with the previously applied pattern. If the wafer is unpatterned the lateral wafer alignment steps are omitted.

It is unclear how damping exists in Kreuzer based on this passage. The passage states that a wafer is employed that has been lithographed and alignment of a subsequent mask pattern with the previous applied pattern is needed. If unpatterned, alignment is unnecessary. Damping is not discussed.

This passage citation in the Office Action could imply that the wafer is the damping means, or the mask pattern is the damping means, or some other Kreuzer element is the damping means – the meaning is entirely unclear. However, in actuality, this passage neither discloses nor suggests damping in any manner, and certainly not “said damping means comprising at least one element mounted in relatively close proximity to said semiconductor wafer” as required by the express language of claim 21.

Claim 21 as amended further includes the limitation of “means for receiving the reflected light energy from the semiconductor wafer, wherein said receiving means are employed for said inspecting.” As inspecting is not performed by Kreuzer, but rather alignment, the limitation is not present in the cited reference.

In short, none of these passages demonstrate the novel aspects presented in the claims. Claim 21 is simply not anticipated by the Kreuzer reference, as Kreuzer neither

suggests nor discloses the unique aspects of claim 21 identified above. Claim 21, as amended, is therefore allowable over Kreuzer.

Claim 28

Claim 28 requires, *inter alia*: damping the semiconductor wafer by mounting a *substantially rigid element* proximate the semiconductor wafer, thereby forming a gap between said *substantially rigid element* and said semiconductor wafer free of components (emphasis added).

As with the “damping means” of claim 21, this “substantially rigid element” limitation is entirely missing from Kreuzer. The Office Action apparently relies on the Kreuzer passage at Col. 12, ll. 27-34 for this “substantially rigid element” limitation. As noted above, that passage deals with the wafer, mask, and mask pattern, and it is unclear where the “substantially rigid element” is shown in the cited passage or anywhere in Kreuzer. The mask is certainly not rigid; the pattern is located on the wafer, apparently does not perform any type of damping, and cannot be said to be a “substantially rigid element;” and the Kreuzer wafer is, at best, the “semiconductor wafer” of the preamble of independent claim 28 and thus cannot be the “substantially rigid member.”

Further, the preamble of claim 28 calls for “[a] method for inspecting both sides of a semiconductor wafer...” Kreuzer does not inspect a semiconductor wafer, as noted above, and certainly does not inspect *both sides* of a semiconductor wafer. Claim 28 further requires “directing light energy toward *each side* of the semiconductor wafer...” (emphasis added). Light energy is not directed toward “each side” of the Kreuzer wafer. No dual sided operation is performed, and certainly not dual sided inspection.

In short, none of the passages cited in the Office Action demonstrate the novel aspects recited in claim 28. Claim 28 is simply not anticipated by the Kreuzer reference, as Kreuzer neither suggests nor discloses the unique aspects of claim 28 identified above. Claim 28 is therefore allowable over Kreuzer.

Claim 35

Claim 35 as amended requires, *inter alia*: a system for *inspecting* a semiconductor wafer; a substantially rigid damping member positioned proximate the semiconductor wafer, thereby forming a gap free of components between the substantially rigid damping member and the semiconductor wafer; and a detector for receiving light energy reflected from the semiconductor wafer, wherein said detector is employed in said *inspecting* of said semiconductor wafer (emphasis added).

As with claims 21 and 28, none of these limitations are present in Kreuzer. As noted above, the Kreuzer reference does not inspect a semiconductor wafer, and Kreuzer does not show a “substantially rigid damping member,” particularly one conforming to the requirements of that limitation of the claim. The passage cited regarding the Kreuzer wafer, mask, and mask pattern do not show a “substantially rigid damping member.” Further, no inspection occurs using the Kreuzer design. For the reasons presented above, claim 35, as amended, is not anticipated by Kreuzer.

In short, none of these passages demonstrate the novel aspects presented in the claims. Claim 35 is simply not anticipated by the Kreuzer reference, as Kreuzer neither suggests nor discloses the unique aspects of claim 35 identified above.

As claims 21, 28, and 35 include limitations missing from Kreuzer, they are not anticipated by Kreuzer. Those claims depending from Kreuzer are allowable as they depend from an allowable base claim and thus include limitations neither suggested nor disclosed by the references of record.

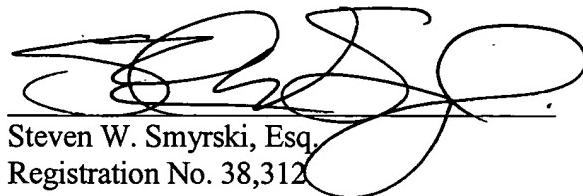
Accordingly, it is respectfully submitted that all pending claims fully comply with 35 U.S.C. § 102.

CONCLUSION

In view of the foregoing, it is respectfully submitted that all claims of the present application are in condition for allowance. Reconsideration of all of the claims, as amended, is respectfully requested and allowance of all pending claims at an early date is solicited.

Applicants believe that no fees are due in accordance with this Amendment beyond those included herewith. Should any additional fees be due, the Commissioner is hereby authorized to charge any deficiencies or credit any overpayment to Deposit Account 502026.

Respectfully submitted,



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